جمهورية مصر العربية

وزارة التربية والتعليم
والتعليم الفني

نموذج إجابة
امتحان شهادة إتمام الدراسة الثانوية العامة
للعام الدراسى ٢٠١٦/٢٠١٧ ـ الدور الأول
المـــادة : الكيمياء (باللغة الانجليزية)

نموذج

أ

نسخة للطلبة للمراجعة ٢٠١٦/٢٠١٧

1- (one mark) (for the question chosen by the student to answer)

(a)- Vanadium.

(b)- Interstitial alloy.

2- (one mark) (for the question chosen by the student to answer)

(a) $2\ HBr + H_2SO_4 \xrightarrow[hot]{conc} 2H_2O + SO_2 + Br_2$

(b)- $Na_2\ SO_4 + (CH_3\ COO)_2\ Pb \longrightarrow 2CH_3COONa + PbSO_4$

3- (one mark) (for the question chosen by the student to answer)

(a) When increasing the concentration of reactants, the number of the reacting molecules increases and the chance of molecules collision increases that leads to an increase in the speed of reaction.

(b) Acetic acid is a weak electrolyte of incomplete ionizahon whose ionization increases with dilution.

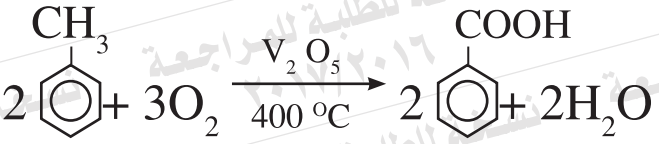
4- (One mark)

Reactions that give springly soluble compounds in water.

5- (One mark)

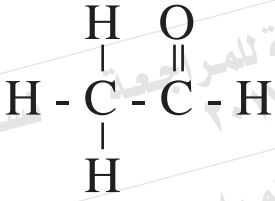
Answer: ⓑ Alkaline.

6- (One mark)



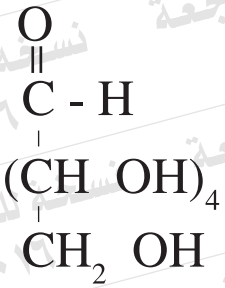
7- (Two marks)

First: Acetaldehyde



(One mark)

Second: Glucose:



(One mark)

8- (Two marks)

Point of comparison	Alcohols	Phenols
Effect on litmus	neutral effect (½ mark)	acidic effect (½ mark)
Reaction with halogen acids	react and give alkyle halide (½ mark)	do not react (½ mark)

9- (Two marks)

First; the electromotive force increases. (½ mark)

because the oxidation potential of magnesium is greater than that of zinc. (½ mark)

or (because magnesium is more active than zinc)

Second: the reaction stops. (½ mark)

because oxidation- reduction process has stopped.

or due to the increase in the concentration of positive ions and negative ions. (½ mark)

10- (One mark) (for the question chosen by the student to answer)

a- Secondary cells.

b- Electrolysis.

11- (One mark)

Point of comparison	Ammonium thiocyanate	Ammonium hydroxide
Adding iron III chloride to each of them	gives blood red colour (½ mark)	reddish brown precipitate is formed (½ mark)

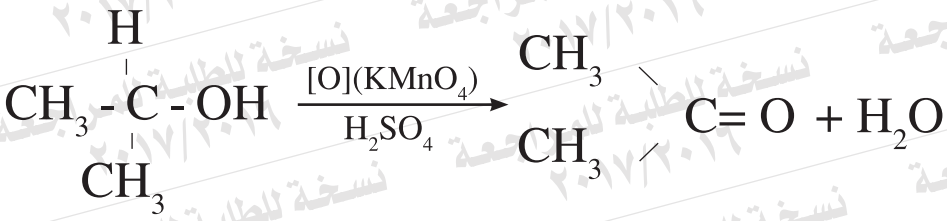
12- (One mark)

Answer: (d), 2.07

13- (One mark)

2- Phenyl, 2- methyl butane

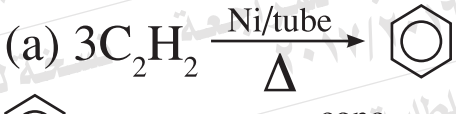
14- (One mark)

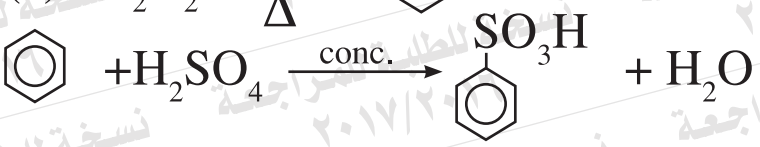


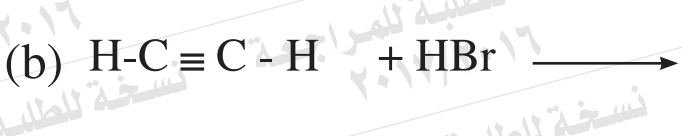
15- (One mark)

Due to changing the concentration of the hydrogen ion concentrations in the solution or changing the partial pressure of the hydrogen gas or both.

16- (Two marks) (for the question chosen by the student to answer)

(a)  (One mark)

 (One mark)

(b) 

17- (Two marks)

$Fe\ CO_3 \xrightarrow{\Delta} FeO + CO_2$ (one mark)

$4Fe\ O + O_2 \xrightarrow{\Delta} 2Fe_2\ O_3$ (one mark)

18- (Two marks)

mass of crystalization water in the sample

= 5.41 - 3.25 = 2.16g (½ mark)

Number of moles water : salt

$\frac{2.16}{18} : \frac{3.25}{152}$ (½ mark)

0.12 : 0.02 (½ mark)

Number of molecules: 6 : 1 (½ mark)

(or any other correct method)

19- (one mark) (for the question chosen by the student to answer)

(a)- Law of mass action

(b)- Activated molecules

20- (one mark) (for the question chosen by the student to answer)

(a) $2Fe(OH)_3 \xrightarrow[200\ ^oC]{\text{higher than}} Fe_2O_3 + 3H_2O$

(b)- $\begin{matrix} COO \\ | \\ COO \end{matrix}\!\!\diagdown\!\!\diagup Fe \xrightarrow[\text{in absense of air}]{\Delta} FeO + CO + CO_2$

21- (one mark) (for the question chosen by the student to answer)

(a) Calcium ion: By adding ammonium carbonate solution:

$CaCl_2 + (NH_4)_2CO_3 \longrightarrow 2NH_4Cl + CaCO_3$

(b) Phosphate ion: By adding barium chloride solution:

$2Na_3PO_4 + 3BaCl_2 \longrightarrow Ba_3(PO_4)_2 + 6NaCl$

22- (One mark)

Fehling solution is used to detect glucose in which its blue colour changes into orange.

23- (One mark)

Answer: ⓐ dichloro diphenyl trichloro ethane.

24- (One mark)

$$CH_3\,COO\,Na + H_2O \rightleftharpoons CH_3\,COOH + Na^+ + OH^-$$

25- (Two marks)

First: The greatest electromotive force = oxidation potential of the anode + reduction potential of the cathode.

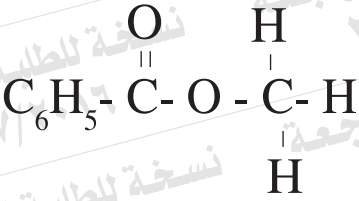
(½ mark)

= 2.7+ 1.36= 4.06 volt (½ mark)

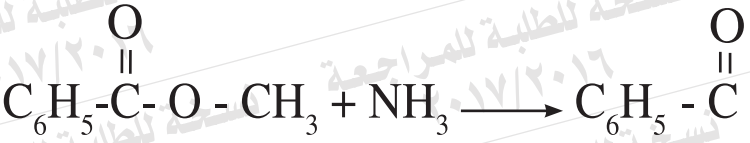
Second: $2Na\,/2Na^+//2Cl^-/\,Cl_2$ (One mark)

26- (Two marks)

The molecular formula of ester (B)



(One mark)



(One mark)

27- (Two marks)

$$2\,CH_4 \xrightarrow[\text{rapid cooling}]{1500\ ^oC} C_2H_2 + 3H_{2(g)} \qquad \text{(One mark)}$$

$$H\text{-}C \equiv C\text{-}H + H_2O \xrightarrow[Hg\,SO_4/\,60^oC]{H_2SO_4\ (40\%)} CH_3CHO \qquad \text{(One mark)}$$

28- (One mark) (for the question chosen by the student to answer)

(a) Urea

(b) 1,1, 1 trichloro ethane.

29- (One mark)

Answer: ⓒ 2- bromo propane.

30- (One mark)

To identify the components of the compound in order to be able to choose the appropriate quantitative method for analysis.

31- (One mark)

Answer: ⓐ

32- (One mark)

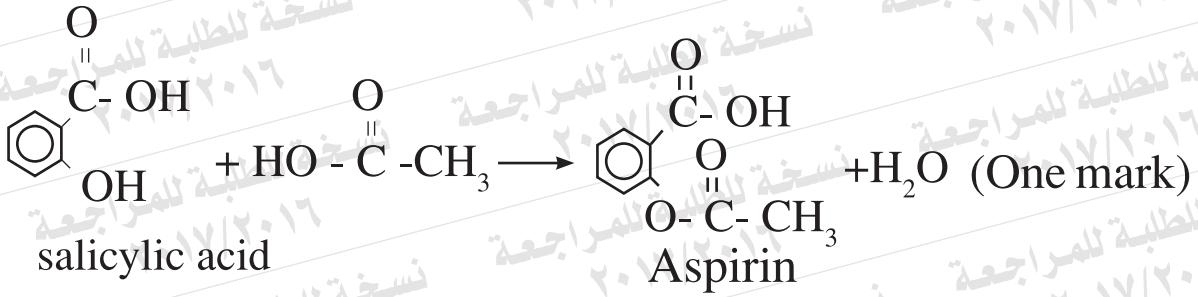
$$Fe_2O_3 + 3H_2SO_4 \xrightarrow[\Delta]{conc} Fe_2(SO_4)_3 + 3H_2O$$

33- (One mark)

Raising the temperature causes the reaction to proceed in the forward direction (i.e the decomposition of SO_3 increases).

34- (Two marks) (for the question chosen by student to answer)

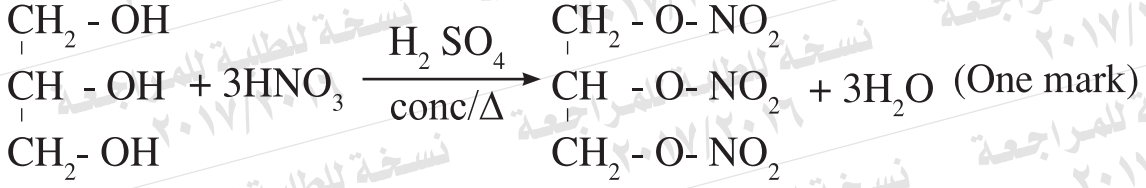
(a)



salicylic acid Aspirin

One use: Treating headache (or any correct use) (One mark)

(b)



It is used as an explosive substance. (One mark)

(or any correct use)

35- (Two marks)

$$\frac{\text{mass of the element (A)}}{\text{mass of the element (B)}} = \frac{\text{equivlent mass of (A)}}{\text{equivlent mass of (B)}}$$

$$\frac{1}{\text{mass of silver}} = \frac{63.5}{2\times108}$$

(One mark)

$$\text{mass of silver} = \frac{2\times1\times108}{63.5} = 3.4\ \text{g}$$ (One mark)

Anather answer:

Quantity of electricity for copper=

$$\frac{2\times96500\times1}{63.5} = 3039.3\ \text{C}$$ (One mark)

$$\text{Quantity of electricity} = \frac{\text{deposited mass}\times 96500}{\text{equivlent mass}}$$ (½ mark)

$$\text{Mass of deposited silver} = \frac{\text{Quantity of electricity}\times \text{equivlent mass}}{96500}$$

(½ mark)

$$= \frac{3039.3\times108}{96500} = 3.4\ \text{g}$$ (½ mark)

36- (Two marks)

First: By adding diluted hydrochloric acid to the alloy, the acid will react with iron but does not react with copper. Copper precipitates and separated by filtration.

(One mark)

Second: Identify and measure the harmful environmental pollutants contained in water and food.

or

determine the percentage of CO, SO_2, NO_2 and NO in air.

(One mark)

37- (One mark)

(a) Iodide anion $(I)^-$ (½ mark)

the precipitate: (AgI) (½ mark)

(b) Bromide anion $(Br)^-$ (½ mark)

the precipitate: (AgBr) (½ mark)

38- (One mark)

Magnesium acts as a sacrifying electrode that protects iron from corrosion.

Or To from a galvanic cell in which iron acts as a cathode and magnesium acts as an anode So, magnesium is corroded instead of iron.

39- (One mark)

$Zn^o + HgO \longrightarrow ZnO + Hg^o$

40- (One mark)

because their atomic radii are nearly the same (A little change in atomic redii through the series).

41- (One mark)

The ion $(Ti)^{4+}$ is colourless and diamagnetic due to the absence of any electrons in (3d) orbitals (empty orbitals)

42- (One mark)

The product of the concentrations of the hydrogen ion (H^+) and the hydroxide ion $(OH)^-$ that are produced from the ionization of water. It equals 1×10^{-14}

43- (Two marks)

(a) $CH_3\ COOH + 2H_2 \xrightarrow[200^oC]{CuCrO_4} CH_3\ CH_2OH + H_2O$

(One mark)

$2C_2HSOH \xrightarrow[conc/140^oC]{H_2SO_4} C_2\ H_5\text{- O- }C_2\ H_5 + H_2O$

(One mark)

(b) $CH_3\ COOH + 2H_2 \xrightarrow[200^oC]{Cu\ Cr\ O_4} CH_3CH_2O + H_2O$

(One mark)

$CH_3\ CH_2O \xrightarrow[180^oC]{H_2SO_4/conc} \begin{matrix} H & & H \\ & C = C & \\ H & & H \end{matrix} + H_2O$

(One mark)

44- (Two marks)

Chloro ethene:

Polymer : Polyvinyle chloride (PVC) (½ mark)

Type of polymerization : by addition. (½ mark)

One property: strong and soft. (½ mark)

One use: drainage tubes or plastic tubes or hoses (or any other correct use). (½ mark)

45- (Two marks)

$Kc = \frac{[CO]\ [H_2]^3}{[CH_4]} = \frac{[0.08]\ [0.04]^3}{[1.2]} = 0.0426$

(one mark) (½ mark) (½ mark)